Application No. 09/651,754 Docket No. 20-0139

REMARKS

Prior to the aforementioned Office action, claims 1, 2 and 4-22 were presented for reconsideration and reexamination. In the Office action, the prior rejections were apparently withdrawn and all of the claims were rejected as allegedly unpatentable over a newly cited reference, a paper by Wolfe et al. entitled "Integrated CNI Avionics Using F-22 Modular Products." The Wolfe paper was applied under 35 U.S.C. §102(b) in rejecting claims 1, 2, 4-8, 14-17, 19, 21 and 22, and under 35 U.S.C. §103(a) in rejecting claims 9-13, 18 and 20. By this amendment, Applicant respectfully traverses the rejections and has amended the claims to distinguish the invention more clearly over the Wolfe paper.

Applicant notes with appreciation the Examiner's objections to claims 1 and 18, which have been amended to correct the informalities pointed out by the Examiner.

The Wolfe paper was published in 1996 and describes the state of the art of integrated CNI (communications, navigation and identification) avionics systems as used in the early to mid 1990s in such aircraft as the F-22 fighter. The inventor, as co-author of the cited paper, was fully aware of this level of avionics integration but regarded it, and still regards it, as a prior art approach upon which the present invention has improved significantly. Regrettably, the claims as filed did not distinguish adequately over the prior art as exemplified by the Wolfe paper. It is hoped that this amendment will remedy this situation to the satisfaction of the Examiner.

What the Wolfe paper describes is a modular approach in which an avionics system is defined to include a number of "Line Replaceable Modules" (LRMs), such as

RF receivers and transmitters (each designed for operation over a particular narrow frequency range), signal processors, data processors and so forth. Figure 1 of the paper shows a generic integrated modular CNI architecture. The basic concept proposed in the Wolfe paper is that this generic architecture may be transferred to other "platforms," i.e., aircraft, by integrating a selection of the LRMs to perform the desired functions on each new platform. Therefore, particular LRMs that had been carefully designed, constructed and tested for reliable operation in performing a specific radio function could be utilized in a different configuration without redevelopment of those modules. Of course, if a new configuration called for a different radio function not specifically performed by an existing module, then a new module would need to be designed or an existing one modified for this purpose. This approach obviously led to the need for a relatively large number of different modules, from which a new radio system could be configured.

What the present invention does, in conjunction with related inventions in companion applications, is to advance the concept of modularity of avionics systems in a very significant way, by defining modules that are much more generic in function than the LRMs of the Wolfe paper. The generic module in this new concept of modularity is the electronic radio system multifunction slice. A multifunction slice, one of which depicted in FIG. 1, provides all the necessary control and processing functions between an antenna and avionics components. Thus, the slice includes an antenna interface, RF processing associated with antenna signals, intermediate frequency (IF) signal processing, and baseband signal processing associated with avionics devices, and an

avionics interface. In general terms, the slice comprises an antenna interface, a number of transceivers, at least one processor, an avionics interface, and various buses for signal communication within the slice and external to the slice.

One aspect of this invention concerns a multifunction slice sub-module referred to as a transceiver-processor building block, such as the block 116 in FIG. 1. As defined by the claims, this building block comprises a plurality of transceivers, a processor, a local (internal to the slice) RF control bus, and a network bus, for effecting interconnection of the multifunction slice of which the building block is a part, to others like it. A key aspect of this concept of modularity is that building blocks of identical or nearly identical design can be incorporated into multifunction slices, which together can be interconnected and configured to perform any combination of desired avionics functions.

Another key aspect of the building block design is that it includes multiple transceivers that are essentially generic in design. That is to say, each transceiver is a single module operable simultaneously in transmit and receive modes, over a wide band of frequencies, in order to support a wide range of radio function frequencies. The transceivers are described as such in the specification, for example in the paragraph beginning on page 10, line 19. The Examiner contends that a transceiver is functionally equivalent to the individual transmitters and receivers broadly disclosed in the Wolfe paper. As should by now be apparent, the present invention requires that the transceivers be essentially generic, in the sense that each of them may be configured

for operation at any desired frequency over a wide band of frequencies, and for simultaneous operation in transmit and receive modes.

The Examiner has based the rejections in part on the assumption that a "slice is read in accordance with the language in the specification to simply mean a grouping or radio resources." Applicant maintains that this assumption is an overgeneralization of the term "slice" not consistent with its usage in the specification, where the term is defined much more narrowly in the specification, as discussed above. In particular, it is key to the invention that the building block of a multifunction slice must contain a plurality of transceivers (configurable to perform transmit and receive operations over any of a wide band of frequencies), a processor (configurable to perform all the functions necessary for controlling the transceivers, for performing signal processing within the slice and for effecting communication with other slices). The Wolfe paper simply does not rise to this level of generic modularity and is concerned only with reconfiguring specific hardware modules in new combinations, to adapt these modules for operation on a different platform.

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The independent claims have been revised in an effort to define the distinctions discussed above more clearly, and to distinguish the claims more clearly over the cited Wolfe paper. The claims are, therefore, submitted for reconsideration in light of these remarks. Withdrawal of the rejections and allowance of the application are respectfully requested.

Respectfully submitted,

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